Clinical Relevance for the Veteran

Veterans' reports of pain and associations with ratings of health, health-risk behaviors, affective distress, and use of the healthcare system

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Purpose of the Work. This study provides data on the prevalence of the experience of pain among veterans receiving care in a Veterans Health Administration (VHA) primary care setting, and describes associations between the experience of pain and several health-risk behaviors, other important psychosocial variables, and use of medical and mental health services. **Subjects and Procedures.** Participants were 685 veterans who completed a questionnaire about their experience of pain and the other variables of interest. Data were also retrieved from an electronic database about the participants' use of healthcare services during the year prior to completing the questionnaire. **Results.** Nearly 50% of the sample reported that they experience pain regularly and that they were concerned about this problem at the time of the index visit to their primary care provider. Persons acknowledging the presence of pain, relative to those not reporting pain, were younger, reported worsening health over the past year, had greater emotional distress, used tobacco, had diet and/or weight concerns, and used more outpatient medical, but not inpatient medical or mental health services. **Relevance to the Veteran Population.** Results support the VHA National Pain Management Strategy that has placed a priority on improving the identification and management of pain among veterans receiving care in VHA facilities.

Robert D. Kerns, PhD

Development and validation of the Pain Outcomes Questionnaire-VA

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Purpose of the Work. This paper presents the results of our efforts to develop and validate a comprehensive and efficient self-report measure of pain treatment outcomes for use with veterans. **Subjects and Procedures.** This study employed two samples (957 total subjects) of veterans undergoing inpatient and outpatient pain treatment at six Veterans Health Administration (VHA) facilities. Subjects in both samples completed the Pain Outcomes Questionnaire-VA (POQ-VA) intake items as a component of a brief psychological assessment during their inpatient admission or initial outpatient appointment. Additional measures administered to selected subsamples of subjects included the POQ-VA Discharge and Follow-Up items, the Minnesota Multiphasic Personality Inventory-2, the Physical Capacities Evaluation, the Pain Visual Analog Scale, the Sickness Impact Profile, the Sleep Problems Questionnaire, the Tampa Scale of Kinesophobia, and the Pain Questionnaire Feedback Form. **Results.** Results of this project support the reliability, validity, and clinical use of the POQ-VA for evaluating the effectiveness of pain treatment for veterans experiencing chronic noncancer pain and provide a more appropriate means of evaluating the efficacy of pain interventions. **Relevance to the Veteran Population.** The development of effective pain treatment strategies requires the availability of precise and practical measures of treatment outcome, and within the VA, the importance of obtaining accurate pain outcomes information has been noted in the VHA's National Pain Initiative. The POQ-VA provides a practical and efficient means of assessing the effectiveness of pain interventions used in the VA and thereby will promote improved pain-related care.

Michael E. Clark, PhD

An examination of the relationship between chronic pain and post-traumatic stress disorder

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Purpose of the Work. Chronic pain and post-traumatic stress disorder (PTSD) are two highly prevalent disorders in the Department of Veterans Affairs (VA) healthcare system that are associated with a significant level of distress and disability. Available research suggests that these two disorders frequently co-occur and may interact in such a way as to impact negatively the course and outcome of treatment of either disorder. This paper summarizes the current literature pertaining to the symptoms, prevalence, and treatment of chronic pain and PTSD; reviews the research describing the comorbidity of both conditions; and describes potential mechanisms of action that may explain the high rates of comorbidity. The current review also sought to emphasize the relative lack of research in this area and to encourage researchers and clinicians to investigate the effectiveness of modifying

existing treatment protocols for chronic pain or PTSD when they co-occur in an effort to improve treatment outcome. **Results.** The results of this review clearly suggest a high rate of comorbidity between chronic pain and PTSD. Several potential mechanisms are presented to explain the high level of symptom overlap between chronic pain and PTSD and to help provide direction for future research. **Relevance to the Veteran Population.** The review is relevant because veterans in the VA healthcare system commonly report chronic pain and also because soldiers sent to fight wars and keep peace are at the highest risk of developing PTSD. This line of research and investigation has particular relevance to the Veterans Health Administration (VHA) as evidenced by the recent promotion of the VHA National Pain Management Strategy designed to promote improved pain management for veterans.

John D. Otis, PhD

Comparison of breathing patterns during exercise in patients with obstructive and restrictive ventilatory abnormalities

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Purpose of the Work. This study was conducted to analyze breathing patterns and shortness of breath of patients with obstructive and restrictive ventilatory abnormalities during exercise. **Subjects and Procedures.** Twenty patients (13 with chronic obstructive pulmonary disease and 7 with restrictive ventilatory abnormalities) completed incremental maximum exercise tests. Shortness of breath was measured at end-exercise with the visual analogue scale. **Results.** The inspiratory to expiratory time and the inspiratory flow to expiratory flow ratio were significantly different between groups at all exercise levels. Expiratory time and inspiratory time to total time were significantly different at baseline and maximum exercise. Shortness of breath scores were not significantly different. For obstructive patients, relationships existed between shortness of breath and inspiratory time to expiratory time, flow ratio, and inspiratory time to total time. **Relevance to the Veteran Population.** Inspiratory to expiratory time changes provide further insight into the pathophysiology of ventilatory abnormalities and shortness of breath during exercise.

Margaret Nield, PhD

Validity and reliability of the motion sensitivity test

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Purpose of the Work. This study determined validity, test-retest reliability, and interrater reliability of the Motion Sensitivity Test (MST). The MST has been used as a guide for developing an exercise program for patients with motion-provoked dizziness and as a treatment outcome measure to monitor the effectiveness of vestibular rehabilitation therapy. **Subjects and Procedures.** Fifteen individuals with motion-provoked dizziness and ten control individuals were tested during sessions occurring 90 minutes and/or 24 hours after baseline testing. **Results.** The MST was found to be reliable across examiners and test sessions, and test validity was good. **Relevance to the Veteran Population.** The MST can be used reliably in clinical practice to develop exercise programs for patients with motion-provoked dizziness and to provide evidence of intervention efficacy.

Faith W. Akin, PhD

Intelligent walkers for the elderly: Performance and safety testing of the VA-PAMAID robotic walker

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Purpose of the Work. This study was conducted to evaluate the safety and performance characteristics of the Veterans Affairs Personal Adaptive Mobility Aid (VA-PAMAID). The VA-PAMAID is a walker that provides both obstacle avoidance capability and navigational assistance. **Procedures.** We performed testing on the VA-PAMAID to determine the stability of the walker, the energy consumption of the electronics, the strength of the frame and components, the robustness of the sensors and control system, and other important factors. **Results.** The VA-PAMAID passed the stability, climate, and fatigue testing without any problems. The walker can travel 10.9 km on a full charge and can avoid obstacles while traveling at a speed up to 1.2 m/s. **Relevance to the Veteran Population.** The number of legally blind and visually impaired veterans is increasing every year. The VA-PAMAID could provide support and navigational assistance to aging veterans while reducing the need for supervision and the overall cost of care.

Andrew J. Rentschler, MS
Rory A. Cooper, PhD

Pressure ulcers in veterans with spinal cord injury: A retrospective study

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Purpose of the Work. This study determined prevalence, duration, and severity of pressure ulcers in veterans with spinal cord injury (SCI) and identified predictors of the (1) number of ulcers that healed, did not heal, or were referred for surgery; (2) number of hospitalizations for pressure ulcer treatment; and (3) SCI clinic or home care visits for pressure ulcer treatment. **Subjects and Procedures.** From a sampling frame of 553 veterans with SCI, 215 (39%) were treated for pressure ulcers in a 3-year period. Retrospective chart reviews were conducted of 102 medical records. More than half of the charts were excluded, primarily because of incomplete data. **Results.** Stage IV pressure ulcers were the most prevalent, and patients averaged nearly four ulcers each. Duration of pressure ulcers varied from 1 week to 3 years. Pelvic ulcers accounted for almost two-thirds of the worst ulcers reported. The majority of the ulcers did not heal. More severe ulcers were less likely to heal and more likely to be referred for surgery. Patients whose study ulcer healed had fewer total numbers of ulcers and fewer clinic or home visits than those whose ulcer did not heal. Over half of the study population was admitted to the hospital for pressure ulcer treatment at least once during the 3 years of the study. Hospitalization was more likely with (1) a motor vehicle crash etiology of SCI, (2) a more complete SCI lesion, (3) a more severe stage of pressure ulcer, and (4) a pressure ulcer located on the ischium or trochanter. **Relevance to the Veteran Population.** Pressure ulcers are a serious, life-long complication of SCI. The Department of Veterans Affairs (VA) administrative data indicate that 41% of inpatient days in the SCI population are accounted for by either primary or secondary diagnoses of pressure ulcers and are estimated to cost as much as $248 million. The financial burden of pressure ulcers does not begin to reflect the personal and social costs that the person with the ulcer and his and/or her family experience. These data document the unacceptable prevalence of pressure ulcers among veterans with SCI and some of the predictors of pressure ulcer outcomes.

Susan L. Garber, MA, OTR, FAOTA, FACRM

Clinical evaluation of functional electrical therapy in acute hemiplegic subjects

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Purpose of the Work. This paper describes a clinical randomized single-blinded study of the effects of Functional Electrical Therapy (FET) on the paretic arms of subjects with acute hemiplegia caused by strokes. FET is an exercise program that integrates voluntary arm manipulation and synergistic electrical stimulation of forearm and hand muscles that control hand opening, closing, and releasing functions. **Subjects and Procedures.** Twenty-eight acute hemiplegic subjects participated in a 6-month study. Subjects were divided into lower functioning groups (LFG) and higher functioning groups (HFG) based on their capacity to voluntarily extend the wrist and fingers against the gravity, and they were randomly assigned to control or FET groups. FET consisted of 30-minute everyday exercise for 3 consecutive weeks and conventional therapy. The outcome measures included the Upper Extremity Function Test (UEFT), Drawing Test (DT) (coordination of elbow and shoulder movements), modified Ashworth scale of spasticity of key muscles of the paretic arm and/or hand, and Reduced Upper Extremity Motor Activity Log (RUE/MAL). UEFT and DT were selected because the first test showed the ability to grasp and functionally use objects with the paretic arm, and the second test showed the ability to coordinate arm movements, providing information about movement organization learning and the spasticity changes, respectively. UEFT and DT brought to the patients an awareness of benefits from FET. The RUE/MAL questionnaire was included to incorporate the users satisfaction in the overall evaluation. **Results.** Both the FET and control groups showed a recovery trend in all outcome measures; yet the gains in the FET groups are much bigger compared to the gains in the control groups. The slopes of the trend lines in the FET groups were steeper compared to the trend lines in the control groups during the first 3 weeks (period of therapy), suggesting a faster recovery of the paretic arm when subjected to FET. The gains in outcome measures were statistically significant in HFG subjected to FET. The LFG subjects showed less improvement than the HFG subjects in both the FET and control groups. Based on the trend lines, we suggest a longer treatment would be required for bigger gains in LFG. UEFT and DT

standard deviations were larger toward the end of the 26 weeks, indicating that differences among subjects in both groups became substantial. Overall improvements should be attributed to a combination of spontaneous recovery, FET, and activities that the subjects achieved voluntarily.

Relevance to the Veteran Population. We developed a new method and instrumentation for treatment of subjects with impact on reaching and grasping. This new methodology is especially important for humans after a cerebrovascular accident, since it promotes faster and better recovery of function in the paretic arm and hand.

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